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The Relationship Between  
Decentration Skills  
and Cognitive Style

by

William H. Johnston

B.Sc., B.Ed., Acadia University, 1971.

A Thesis

Submitted to the Faculty of Graduate Studies through the  
Department of Psychology in Partial Fulfillment  
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1973

# ABSTRACT

The purpose of this study was to investigate the relationship between spatial egocentrism (decentration), and the cognitive styles of reflection-impulsivity and conceptualization preferences.

Forty kindergarten and grade one males, from two schools, were individually administered tests of intelligence (PPVT), spatial egocentrism, reflection-impulsivity (MFF), and conceptual style (CST).

In accordance with expectations, reflective Ss were less spatially egocentric than impulsive Ss, however, when MA was taken into account by covariate analysis no differences were found between these groups on spatial egocentrism. At variance with predictions based on previous evidence (Peters, 1967, 1970), the decentration measure was not related to analytic conceptual style. The less spatially egocentric children were, however, higher ( $p < .08$ ) in production of categorical-inferential concepts on the CST. This finding was interpreted in the light of Flavell's (1971) emphasis on inferential activities in role-taking.

The proposed relationship between reflection-impulsivity, and conceptual style (Kagan, et al., 1963, 1964) was not upheld in the present study. Indeed, reflective Ss were found to be significantly ( $p < .07$ ) lower than impulsive Ss in the production of analytic concepts on the CST.

Also, it was found that the two school samples, differing only slightly in social class level, did not differ on the decentration measure, contrary to predictions based on previous evidence. The two school samples did not differ on any of the variables, however, interesting differences in the interactions of these variables, within each school, were discussed.

## ACKNOWLEDGEMENTS

A combination of Dr. Rubin's encouraging acceptance of a naive newcomer to Piagetian constructions, his suggestions for research, and his prodigious prodding of my conceptual meanderings culminated in this study.

I wish to express my appreciation to Dr. Rubin for his assistance, and to my mate, Pamela, for her love, patience and stimulation.

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## CHAPTER I

### INTRODUCTION

The purpose of this study was to investigate the relationship between childrens' inability to decenter, that is, to shift cognitive perspectives, their conceptual style, and their tendency toward reflectiveness or impulsivity in cognitive functioning.

Decentration, or the ability to shift cognitive perspectives, has been suggested by Piaget (1928, 1962) to be a fundamental concept governing the acquisition of knowledge in the developing child's construction of reality. The inability to shift perspectives has been shown to account for egocentric functioning (maladaptive and relatively primitive) within three transitional stages as the child matures to formal operational thought (Flavell, 1966; Flavell, Botkin, Fry, Wright and Jarvis, 1968; Piaget and Inhelder, 1968). Feffer (1959, 1960, 1966, 1970) has successfully applied the concept of decentration to the realm of interpersonal perception and behavior in late childhood. Recently, Rubin (1973) found evidence for a common decentration factor underlying three forms of egocentric functioning (role-taking, communicative, and spatial) and conservation abilities.

Among the variables that have been related to decentration is conceptual style. Conceptual style (Kagan, Moss and Sigel, 1963) may be defined as the preferred manner of grouping stimuli and the level of abstraction that an individual uses in perceiving and ordering objects in the environment. Peters (1970), for example, found analytical conceptual style to be a good predictor of children's performances on conservation tasks (a measure of decentration). Weinberg (1963), too, reported a positive relationship between analytical conceptual style and left-right



relations which implies decentration skills.

The tendency toward reflectiveness when faced with tasks which present a number of plausible alternative solutions has been posited as a possible antecedent to analytical conceptual styles (Kagan, Posman, Day, Albert, and Phillips, 1964). Peters (1967) reported significant correlations between impulse control, attention span and conservation abilities: the former dimensions underlying a reflective cognitive style.

Taken together, the Peters (1967, 1970) studies and other theoretical statements (Flavell, 1963) suggest that an analytical conceptual style and a reflective orientation in cognitive functioning would be highly related to Piagetian tasks other than conservation, which require decentration, as in adopting the spatial perspective of another person. This research is thus directed at an analysis of the interrelationships of these cognitive styles and abilities.

#### DECENTRATION:

(a) Theory - Egocentrism, or the inability to decenter, has been a very important concept in Piaget's (1928, 1969) theory. In his earlier writings, Piaget spoke of a child cognizer who sees the world from a single point of view or perspective, without being aware that he is a prisoner of this limited perspective. The egocentric pre-schooler, for example, is unaware of the distortion in his construction of reality which results from his failure to entertain alternative points of view. More specifically, according to Piaget, the child's assimilations (incorporation of milieu elements by modifying them) take precedence over his accommodations (adjustments of the cognitive system to the elements of the milieu).

The conceptualization of egocentrism as a relative assimilation-accommodation disequilibrium is further elaborated by Flavell (1963):

"Thus with the various developmental levels of symbolic construction as well as with elemental sensory-motor behavior, cognition always begins on the margin of both self and milieu and works its way simultaneously into the inner region of each [p. 65]". The preoperational child for example exhibits his egocentric form of cognizing in his nonadaptation of speech to listener needs (Flavell, et al., 1968; Piaget, 1950) in his lack of perspective shift in visual behavior (Davol & Hastings, 1966; Inhelder & Piaget, 1958) and in his inability to treat his own thoughts as objects of thought (Piaget, 1967).

Piaget (1962 & 1969) emphasized that egocentrism was not the result of an individualism which precedes relations with others and the environment, but the result of a lack of differentiation between one's point of view and the other possible ones. It is important to keep firmly in mind the role that Piaget ascribes to egocentric functioning. Piaget localizes the beginning of thinking in the context of adaptation in a more or less biological sense. However, adaptation is not always the outcome of an interaction between an organism and its environment.

Piaget (1962) envisages two limitations which impose on the adaptive process. The first involves the lack or underdevelopment of the means or organs of adaptation necessary for certain tasks. The second limitation is fundamental to an understanding of the concept of egocentrism. Adaptation is defined as an equilibrium between assimilation and accommodation; this equilibrium may not always take an adaptive form, thereby producing systematic errors. These systematic errors are found at all levels of the intellectual hierarchy - from affective behavior to the Einsteinian

liberation of physics. Piaget (1962) elaborates: "...the progress of knowledge never proceeds by a mere addition of items or of new levels, as if richer knowledge were only a complement of the earlier meager one: it requires also a perpetual reformulation of previous points of view by a process which moves forward as well as backward, continually correcting both the initial systematic errors and those arising along the way. This corrective process seems to obey a well defined developmental law, the law of decentration or decentering [p. 3]." To Piaget, then, egocentrism designates the initial inability to decenter, that is, to shift the given cognitive perspective.

Inhelder and Piaget (1958) have delineated three types of egocentrism as the child progresses to higher levels of cognitive maturity. (a) At the sensory-motor level (0-2 years), the child's interactions are characterized by a complete lack of differentiation between himself and his actions and the characteristics of the given situation. Decentering occurs with the polarization of these subject-object poles with the resulting formation of the object concept and the differentiation of his own ego. (b) The preoperational child (2-7 years) is a prisoner of symbols - although this capacity for representation released him from object egocentrism - he now believes that word symbols convey much more information than they actually do for a listener. The emergence of concrete operational thought coincides with the breakdown of this form of egocentric functioning. The child is able to decenter, to shift perspectives, and to consider both viewpoints simultaneously. This results in an ability to retain both symbol and its referent in mind and thus distinguish between them. (c) The third form of egocentric thought is evidenced by school-age children in their inability to treat their own thought as an object of thought, that is, to separate perceptual

givens and their mental constructions. This form of egocentrism wanes with the emergence of formal operational thought in early adolescence. Looft (1972) views this dialectic transition as one in which "cognitive structures that free the child from a lower form of egocentrism are the same structures that entangle him in a higher egocentric form [p. 727]". Thus, increased differentiation between self and environment along increasingly abstract levels appears to evolve throughout childhood. The increased differentiation within and between the environment and the developing child (part-whole and subject-object respectively) should be kept in mind as it will be re-instated later as a potential link between other cognitive variables and the developmental nature of egocentrism.

#### RESEARCH:

(b) Flavell and his associates have conducted a number of investigations into the realm of role-taking and communication skills (Flavell, 1966; Flavell et.al. 1968). This research has supported and extended Piaget's studies of social communication with the major finding being that younger children confuse their own perspective with that of the listener. Cowan (1966) extended the egocentrism/role-taking issue, using a modified experimental procedure and concluded from his study that egocentric language provides a link between the cognitive structural aspects of the child and his social interaction.

A more intensive investigation of this link, and a series of studies designed to extend Piaget's concept of decentration to interpersonal perception and behavior has been followed by Feffer (1959, 1960, 1966, 1970). His initial study (1959) produced a new measure of decentration - the Role Taking Task (RTT). This measure, an adaption of the Thematic Apperception Test, required the subject to perceive a portrayed role from a number of different perspectives. The RTT correlated highly with Rorschach developmental levels, suggesting that decentering activity is applicable

not only to an analysis of the articulation of the physical world and communication in a social context, but also to the cognitive structuring of social content as revealed in the RTT. A subsequent study (Feffer, 1960) yielded significant positive relationships between the RTT and three Piagetian cognitive tasks at four age levels (6 to 14 years). This study suggested that prior attainment of a certain level of development in the structuring of the physical world, as measured by the Piagetian tasks, might be prerequisite to the development progress in the realm of social objects, as measured by the RTT. This is in contrast to Piaget's (1950) view that impersonal cognitive structuring and taking the perspectives of others are "...two complementary aspects of one and the same whole since equilibrium of one depends on that of the other [p. 166]". Pursuing decentration further, Feffer & Suchotliff (1966) found that decentering ability, as judged by his RTT measure was positively related to the ability to communicate with limited information cues, suggesting enhanced social perception. More recently, Feffer (1970) has presented a more extensive theoretical formulation of the role of decentration in interpersonal perception and behavior. His analyses of role-taking productions have shown that his stages of uncorrelated, sequential, and simultaneous decentering occur approximately at the ages of 6, 7-8, and 9 years respectively. Effective social interaction, in Feffer's model necessitates not only the sequential decentration, or shifting of perspectives but also simultaneous decentration: effective social interaction requires successive modification of one's behavior in anticipation of the other's reaction to this behavior. Furthermore, modification of a person's behavior requires that he view the intended action from his own perspective at the same time (Feffer & Suchotliff, 1966).

Piaget (1950) and others (e.g., Feffer, 1959, 1970) have suggested that decentration, the ability to shift the given cognitive perspective, is the single construct underlying all overt forms of egocentric behavior. If this is so, then one might expect empirical measures of different forms of egocentrism to be highly interrelated. Also, since the ability to decenter is manifest in the correct solution of conservation problems, (i.e. requires simultaneous consideration of two dimensions), one would expect a strong positive relationship between performances on both conservation and egocentrism tasks. Early studies (Cowan, 1966; Sullivan and Hunt, 1967) presented inconclusive results in their attempts to identify the hypothesized common factor. However, in a recent study, Rubin (1973) found a common decentration factor underlying spatial role-taking and communicative egocentrism, and conservation abilities.

Attempts to isolate environmental variations influencing decentration skills have largely dealt with social class. For example, Wei, Lavatelli, & Jones (1971) found that lower class children progressed at a slower rate than middle class children in the development of conservation abilities. Similarly, Sullivan and Hunt's (1967) results suggested social class differences in decentering abilities in spatial tasks and the KTT.

Piaget's concept of egocentrism, more specifically the initial inability to decenter, has thus been shown to apply to a number of developmental stages; to a wide range of tasks and acquisition of concepts in the impersonal, physical world; to early language development; and to interpersonal perception and behavior, both in late childhood, and early adolescence.

#### CONCEPTUAL STYLE:

Conceptual style is an additional class of cognitive style variables

worthy of attention. This term refers to stable individual differences in perceptual organization and conceptual categorization of the external environment. One style involves the tendency to analyze and differentiate the stimulus environment, in contrast to categorizations that are based on the stimulus as-a-whole. Initial exploratory attempts to investigate these opposing orientations (Kagan, et al., 1963) indicated three different, formal, conceptual categories which fell within these more global individual differences.

One of these categories was termed analytic-descriptive. In this category are concepts that are based on similarity in objective elements, within a stimulus complex, that are part of the total stimulus. The element on which the individual bases objective similarity between two objects or figures, is a differentiated part of the total stimulus. Also, the conceptual label the individual uses, refers to the objective attribute shared by the grouped stimuli, e.g. "people holding weapons".

A second category was termed categorical-inferential. This category involves judgments of similarity between two objects based on an inference about the grouped objects. The grouping does not follow directly from a shared common partial objective attribute of the stimuli. Also with inferential concepts, any stimulus in the group is an independent instance of the conceptual label, e.g. "people who help others".

The third category, termed relational, includes concepts which are based on a functional relationship between or among the stimuli grouped together. In this category, no stimulus is an independent instance of the concept. Each stimulus gains membership to the group on the basis of its relationship to other stimuli in the group, e.g. "people arguing with each other".

The important differences among these categories involves their degree of analysis of the stimulus array. Relational categories require the least analysis and differ from analytic-descriptive concepts with respect to the part-whole analysis of the stimulus: "...descriptive concepts involve an active conceptual analysis, while relational concepts seem to involve a passive acceptance of the entire stimulus [Kagan, et al., 1963, pg. 77]." The active analysis in descriptive groupings is towards the isolation of more subdued attributes of the particular stimulus (figure from ground), in contrast to the passive reaction to the stimuli's most obvious and global aspects in relational concepts.

Kagan and his associates (1963) carried out a series of studies to investigate the generality, stability and development of these different modes of conceptual organization, as evidenced in performance on the Conceptual Style Test (CST). Their studies of both adults and children involved a wide range of verbal, apperceptual, reaction-time and sorting tasks. Their findings indicated that analytic and non-analytic response styles are moderately stable over time, the former style gradually increasing and the latter decreasing during the early school years. Reaction time for analytic statements was greater than that for relational statements, suggesting a more reflective approach to the tasks.

A longitudinal study (birth to adolescence) conducted at the Fels Institute, investigated the antecedents and behavioral correlates of these conceptual variables. The experimenters (Kagan, et al., 1963) found that an analytic style was associated with a reflective attitude, a tendency to differentiate experience and an ability to resist the effects of distracting stimuli on ongoing behavior. Non-analytic styles



were associated with impulsivity, more reactivity to external stimuli, less differentiation of complex stimulus situations, more hyperkenesis or uncontrolled motoricity and more impulsive aggression.

Subsequent research with the conceptual style variable has extended evidence of the influence of analytic style in other areas of cognitive functioning, specifically with respect to Piagetian tasks. Indirectly, Peters (1967) found that qualities of the analytic child, such as greater impulse control, attentiveness, and greater resistance to distraction, are highly associated with early mastery of conservation tasks. In a later study, Peters (1970) found that analytic sorting behavior was a reliable predictor of number conservation and influenced the type of training procedure which proved to facilitate conservation. Another attempt to relate various cognitive style variables (Garretson, 1971) failed to relate analytic style with three Piagetian tasks designed to test children's understanding of the logic of classification (property and inclusion).

A second major series of studies reported by Kagan and his associates (Kagan, et al., 1964) pursued the antecedents of the analytic style and found two major factors influencing analytic conceptualizations. These were 1) reflection, and 2) visual array analysis strategy, the first of which will be dealt with below.

#### REFLECTION-IMPULSIVITY:

Another dimension of cognitive style has gained prominence in research on conceptual style. This dimension, one of cognitive tempo, has been termed Reflection-Impulsivity (R-I). Reflection is defined as a tendency to produce longer decision times and fewer errors in tasks which present a number of plausible alternative solutions.

A number of studies (Kagan, et al., 1963) have indicated that the tendency to delay a conceptual decision is associated with the production of analytic statements on the CST. A second series of studies (Kagan, et al., 1964) further strengthened this association. It was found that the more fundamental processes of reflection versus impulsivity and visual analysis of complex arrays are primary determinants of analytic conceptualizations. The strongest evidence for this association was found in a study (Kagan, et al., 1964) in which children who were instructed to delay their responses, not only had longer response latencies, but also produced more analytic responses than children instructed to hasten their responses. Cognitive tempo thus appeared to be a basic disposition underlying conceptual style.

Corroboratively, overt behavioral correlates of an analytic attitude among boys consisted of 1) a capacity for sustained concentration in intellectual tasks, 2) the absence of an extreme degree of task irrelevant gross motor activity, and 3) inhibition of impulsive solution hypotheses in varied problem tasks.

In the light of this evidence, the authors (Kagan, et al., 1964) suggested the following interpretation: "the dominant response association to the presented figures (CST) is a functional bond between the figures. If the child is to produce an analytic response, he must suppress these initially strong "popular" associations and reflect over alternative responses [pg. 32]". Then, given this reflective attitude, if he possesses a tendency for visual analysis, he will likely produce an analytic concept. Thus reflection over alternative solutions coupled with a tendency to analyze, intuitively and empirically, contributes to analytic conceptualizations.

The relationship between analytic style and reflectivity was originally established with the Design Recall Test (DRT) and the CST. In an attempt to obviate the moderate positive relationship between accurate performance on the DRT and I.Q. score, a new test for reflection-impulsivity (R-I) was designed. This new test was called the Matched Familiar Figures Test (MFF) (Kagan et al., 1964). The MFF did not depend on memory skills and also used familiar figures, in contrast to the DRT.

This new measure (MFF) of reflection-impulsivity again showed high stability over time and good generalizability to a number of tasks. With this measure, and across tasks, reflection was defined as the consideration of alternative solutions hypotheses (either classification or problem solving sequences), when many alternatives are available simultaneously.

Subsequent research on this dimension has verified the validity of stable decision speed differences between individuals (Kindergarten, grade 2 and 3 children) in other tasks as different from the MFF as tachistoscope reporting (Kagan, 1965; Ward, 1968). Similarly, reflective tendency was found to generalize to inductive reasoning tasks that contain response uncertainty (Kagan, 1966).

The evidence relating R-I to Piagetian tasks and, more specifically, to decentration, is of an indirect nature. Peters (1967) reports previous findings which indicate conservation of number to be significantly correlated with impulse control, attention span, and continuation in activities. These dimensions are similar to the underlying characteristics of Kagan's "reflectives". In another study, Peters (1967) reported more disruptive behavior (wandering and disinterest) in non-conservers. In summary, he suggests that the child who

achieves conservation of numerical correspondence (decentration skills) before his agemates, possesses greater attentiveness, impulse control, persistence, and resistance to distraction. This behavior range matches Kagan's picture of the reflective child and adds some support to the notion that differences on the R-I dimension are important to the attainment of conservation of number and other decentration abilities.

#### STATEMENT OF PROBLEM:

The ability to decenter, to shift a given cognitive perspective, would appear to be facilitated by a patient, probing orientation toward one's environment. Specifically, then, one would predict that the analytic, reflective child would also be able to decenter in a perceptual task. Conversely, the non-analytic (relational or global) impulsive child would exhibit a greater inability to decenter.

An analytical conceptual style (Kagan, et al., 1963) which is conducive to selective attention to those specific elements or dimensions of a task upon which successful solution depends, would appear to be related to a child's ability to decenter. Decentration requires selective attention to the relevant dimensions of the egocentrism task, and the ability to perceive these dimensions in relation to the whole - that is, to see their task relatedness. Accordingly, Peters (1970) found analytical conceptual style to be a good predictor of conservation abilities. Weinberg (1963) found a small but significant positive relationship between analytical categorization style and egocentrism as measured by the child's ability to understand the concepts of "brother" and "left and right".

Related and perhaps antecedent to this analytic conceptual style (Hess & Shipman, 1968; Kagan, 1966; Kagan et al., 1964; Ward, 1963) and, it would seem, mandatory for decentration, is the tendency toward reflectiveness. Peters' (1967) findings suggested that conservation of number was facilitated by a "reflective" approach to the task. Correct solution of Piaget's spatial egocentrism task would appear to require a similar orientation in the child.

In accordance with evidence cited above, the following hypotheses are set forth with respect to the testing of six-to-seven year old males on a spatial egocentrism task and on measures of both reflectiveness and conceptual style:

- a) Reflective children will exhibit greater ability to spatially decenter than will impulsive children.
- b) Children who show greater usage of analytic concepts will exhibit greater ability to spatially decenter than children who predominantly classify with relational concepts.
- c) Children from a lower social class background will exhibit greater inability to decenter, in accordance with past evidence (Sullivan and Hunt, 1967; Wei, et al., 1971) indicating slower rate of development of decentration abilities in lower class children.

## CHAPTER II

### METHOD

#### SUBJECTS

The sample was drawn from the Windsor Board of Education. Forty boys were chosen from an age range of 70 to 80 months. Twenty of these boys were of a lower to low-middle social class background (School A) and twenty of a middle class background (School B) as judged by their father's occupational status. A verbal intelligence quotient for each child was assessed.

#### PROCEDURE

The tasks used to measure spatial egocentrism, Reflection-Impulsivity, Conceptual Style, and I.Q., were administered to each child in two sessions. The spatial egocentrism task and the Reflection-Impulsivity Test were administered during the first session. The Conceptual Style Test and the Peabody Picture Vocabulary test were administered during the second session. A period of 2-3 days elapsed between sessions.

#### COGNITIVE MEASURES:

Spatial Egocentrism - Spatial egocentrism was measured in a manner identical to that of Flavell et al., (1968). Four stimulus displays were presented to each S, one at a time, always in the sequence 1-2-3-4. The elements of each display were fastened to a small board to keep their spatial interrelationships constant. With each presentation the S was given a duplicate set of unattached materials with which he can reproduce the display from any given perspective. The model was placed in the middle of a small rectangular table. The S was seated at the head of the table while the E sat at the same table in a position

approximately 45 degrees to the S's right. After looking at the display, the S attempted to reconstruct the E's view of it on a small desk directly to his right.

The displays were ordered in difficulty, as in the original study by Flavell et al., (1968), such that each succeeding display placed an additional demand on the S by adding a new feature that had to be taken into account in trying to reproduce the E's perspective. For example, Display 1 was comprised of a single red wedge of wood. Display 2 consisted of three blue cylinders of equal height, whereas Display 3 had three blue cylinders, each different in height. Display 4 had three cylinders equal in height to those found in Display 3. However, half of each cylinder was red, and half was blue.

Each S who was unsuccessful in portraying the E's perspective for Display 1 was asked to walk to the E's position to "see what he sees from over there". Only with Display 1 was the child given a second opportunity to arrange the materials. The scoring procedure used was identical to that of Flavell et al., (1968). This procedure embodied several assumptions. First it was assumed that an adequate performance on a more complex and demanding display subtask should be weighted more heavily than success on a less complex and demanding one. Thus the maximum scores for each subtask were 3, 4, 5 and 6 for Displays 1, 2, 3 and 4 respectively (total possible score is 18). Further assumptions will be apparent in the following scoring procedure:

#### Display 1

- 3 configuration correct on first attempt
- 2 incorrect on first attempt, but correct on second attempt  
(that is, after going over to look from E's position)

- 1 incorrect on first attempt, and the second arrangement is any other correct one
- 0 incorrect on first attempt, and the second arrangement is the egocentric, S-perspective one

Display 2

- 4 configuration correct
- 1 miscellaneous
- 0 egocentric

Display 3

- 5 both configuration and height correct
- 4 configuration correct, "H" cylinder properly placed, but M and L cylinders incorrectly placed, relative to each other, on either the right-left or the front-back (or both) dimensions
- 3 configuration correct but height "more incorrect" than in 4
- 2 configuration incorrect but height correct or partly correct (that is, correct ordering of cylinders on either right-left or front-back dimensions, but not both)
- 1 miscellaneous
- 0 egocentric (both in configuration and in height)

Display 4

- 6 configuration and color correct, and height at least partly correct
- 5 configuration correct, height at least partly correct, but color only partly correct (i.e., only two of the three cylinders properly oriented as regards color)
- 4 configuration correct, and either height or color (not both) at least partly correct



- 3 either of the following: (a) configuration correct but neither height nor color even partly correct, (b) configuration incorrect but both height and color at least partly correct
- 2 configuration incorrect, but either height or color (not both) at least partly correct
- 1 miscellaneous
- 0 egocentric (in configuration, height and color)

The raw data which was available to the judge consisted of the sheets of paper on which the Ss had arranged their duplicate sets of display elements. As soon as the S had finished a given arrangement E quickly traced around each element and made other necessary notations regarding position, height and color. These annotated tracings were then compared against a standard: a thin translucent sheet of paper with the exact arrangement of elements traced on it. By superimposing this sheet over S's record and rotating it in 90° steps, the judge made a variety of estimates concerning the record. The general judgment followed was of a "best fit" variety.

The total number of points each S could accrue was 18. The higher the score, the less spatially egocentric the child was considered, and therefore the more able to decenter or shift perspectives.

Reflection-Impulsivity - The reflection-impulsivity dimension was measured with the Matched Familiar Figures Test developed by Kagan and his associates (Kagan, et al., 1964).

In the administrations of this test, the S was shown a picture of a familiar object (the standard), and six similar variants (e.g. Appendix B). The S was instructed to select the one variant that is exactly like the standard. Following S's response, the E told the S whether his response was

correct or incorrect. If incorrect, the S continued with this item presentation until correct in his selection of the figure variants. The mean response time to the S's first hypothesis on each item presentation and the total number of errors for the 12 item test were recorded.

Errors and response time were combined to identify reflective and impulsive Ss. Reflective Ss were defined as those having average response times above the median and error scores below the median for the total group tested. Conversely impulsive Ss were defined as those having average response times below the median and error scores above the median.

Conceptual Style - The technique used to determine the S's preferred categories of sorting behavior was one developed by Sigel (Kagan, et al., 1963). This test, called the Conceptual Style Test, consists of a set of 17 cards, each with 3 black and white drawings of familiar objects (e.g. Appendix C).

The child was asked to "Pick out two pictures that go together, belong together or are related in some way", and to state the reason for his grouping. E then asked the S to try the first card. Following the S's response, additional possible groupings were pointed out to him: "That was very good, you could also have chosen these two or these two, (reasons explained)". Following this, the child proceeded with the remaining cards

E recorded each choice and elicited the S's reason for the grouping. Responses were assigned to one of the following four categories:

1. (a) Analytic descriptive (Part-Whole): In this category were scored all groupings built upon similarity in objective elements, within a stimulus complex that were a part of the total stimulus.

The element(s) selected as the shared basis of similarity between two or more objects were a differential part of the stimulus whole. Example: "They both have hats on".

(b) Analytic-descriptive (Global): Groupings in this category were also based on direct reference to a denotable physical attribute. This category differs from the analytic Part-Whole category in that the conceptual label implies the physical attribute, and differs from categorical-inferential in that an inference is not used in the labeling. Responses employing age, sex and status categories were included in the group.

2. Relational - Counted in this category were groupings built upon a functional relationship between or among the grouped objects. No one object was an independent instance of the concept used for grouping. The objects so organized were seen as interacting with each other, or being found in the same context. Example:

"Doctor and nurse or wife cooking supper for husband".

3. Categorical-Inferential - Groupings here were organized on the basis of common class membership or functional usage. Any object in the group was an independent instance of the conceptual label. Example: "All these people work for a living".

4. Other - this category included all sorts not classifiable under the other three categories.

Responses in each category were converted to the proportion of the category statements to the total number of overall responses. For example, if an individual made 20 analytic, (Global & Part-Whole combined), 20 relational, 10 categorical-inferential, and 0 unclassifiable statements, his scores in proportion became 1) analytic .40, 2) relational .40, and

3) categorical-inferential .20.

Verbal Intelligence - The child's verbal skills were measured with the Peabody Picture Vocabulary Test (PPVT) according to the standard procedure of administration and scoring outlined in the test manual. All scores were then transformed into an index of mental age (MA) in months.

## CHAPTER III

### RESULTS

The variables subjected to analysis were spatial egocentrism, response latency and response error on the Matched Familiar Figures test (MFF); the proportion of analytic, relational and categorical-inferential responses to the total responses on the Conceptual Style test (CST); mental age (MA) derived from the PPVT; and chronological age (CA).

The distribution of scores on the spatial task was positively skewed, and the sample variances of the egocentrism scores in the R-I comparison proved significantly different. ( $F_{\max}=2.63$ ,  $df=15, 14$ ,  $p<.08$ ). As a result, the spatial egocentrism scores were transformed by the formula,  $\sqrt{x+.5}$  (Winer, 1962, pg. 220) to normalize the data.

A high and disproportionate relationship existed between the total number of responses emitted on the CST and the production of analytic, relational, and categorical-inferential statements. That is, the frequencies of total analytic, relational and categorical-inferential statements were correlated with total responses, .32, .73, .53 respectively. Furthermore, there was an extremely wide range of total responses, regardless of conceptual category utilized, for the CST (range = 19-58). Thus, it was decided to convert each categorization frequency to a proportion of the total responses. For example, if a S emitted a total of 40 responses, 20 of which were relational, the proportion of relational to total responses was .50. By translating the conceptual category responses into proportions, the effect of total response production, which was varyingly associated with spatial egocentrism, response latency, and MA, was reduced. Also, since the total analytic frequency (Part-

Whole plus Global) was highly correlated (.92) with analytic part-whole frequencies, these sub-categories were combined in the analyses.

A correlation matrix (Pearson product - moment correlation coefficients) of all variables of interest for the total sample is presented below (Table 1). Performance on the spatial egocentrism task was significantly related to MA ( $r = .54$ ,  $p < .01$ ). Response latency was related to both response error ( $r = -.52$ ,  $p < .01$ ), and CA ( $r = .32$ ,  $p < .05$ ). Response error was significantly related ( $p < .05$ ) to both CA ( $r = .39$ ) and MA ( $r = -.33$ ). The proportion of analytic concepts was significantly related to the proportion of relational concepts ( $r = -.76$ ,  $p < .01$ ) and categorical-inferential concept ( $r = -.67$ ,  $p < .01$ ). The proportion of relational concepts was significantly related to the total number of responses on the CST ( $r = .40$ ,  $p < .01$ ).

TABLE I

Correlation Matrix for all variables: Spatial Egocentrism (SE), Response Latency (RL), Response Error (RE), Total Responses (TR), Analytic (Ap), Relational (Rp), and Categorical-Inferential (Cip) proportions, CA and MA: TOTAL SAMPLE

	SE	RL	RE	TR	Ap	Rp	Cip	CA	MA
SE									
RL	0.11								
RE	-0.21	-0.52							
TR	0.22	0.06	-0.12						
Ap	0.01	-0.07	0.09	-0.27					
Rp	0.03	-0.02	-0.04	0.40	-0.76				
Cip	-0.00	0.11	-0.10	-0.01	-0.67	-0.04			
CA	0.12	0.32	-0.39	-0.20	0.06	-0.25	-0.21		
MA	0.54	0.29	-0.33	0.19	-0.14	0.08	0.12	0.06	

critical r value for  $p < .05 = .30$   
critical r value for  $p < .01 = .393$

The correlation matrix for each school sample is presented below (Table 2). Within School A, significant relationships were found between response latency and response error on the MFF ( $r = -.66$ ,  $p < .01$ ).

The proportion of analytic concepts was negatively related to the proportion of categorical-inferential statements ( $r = -.67$ ,  $p < .01$ ) and relational concepts ( $r = -.77$ ,  $p < .01$ ). Relational concepts were positively related to the total CST responses ( $r = .58$ ,  $p < .01$ ). Total CST responses were also related to CA ( $r = -.59$ ,  $p < .01$ ).

Within School B, spatial egocentrism was significantly related to response latency ( $r = .44$ ,  $p < .05$ ) and MA ( $r = .65$ ,  $p < .01$ ). However, partial correlational analysis revealed that the significant relationship between spatial egocentrism and response latency was due to the MA variable ( $r_p = .03$ ).

Response latency on the MFF was significantly related to response error ( $r = .45$ ,  $p < .05$ ) total responses on the CST ( $r = .51$ ,  $p < .05$ ), and MA ( $r = .70$ ,  $p < .01$ ).

Response errors on the MFF was significantly related to MA ( $r = -.44$ ,  $p < .05$ ). Total responses on the CST was highly related to MA ( $r = .62$ ,  $p < .01$ ). The proportion of categorical-inferential responses was highly and negatively related to the proportion of analytic responses ( $r = -.66$ ,  $p < .01$ ).

The means and standard deviations of all variables for the total sample and each school are presented in Table 3 below. Statistical analyses (t-tests) on the differences between schools on each of the variables indicated no significant differences.

Within each school, the Ss were defined as either reflective or impulsive according to the median splits on response latencies and response errors. A t-test on the egocentrism scores indicated no differences in School A between the spatial abilities of reflectives and impulsives. Within School B, a significant t-test ( $t = 2.90$ ,  $df = 12$ ,  $p < .02$ ) indicated greater decentration skills for reflective children than for impulsive children.

TABLE 2

Correlation Matrix for all Variables: Spatial Egocentrism (SE), Response Latency (RL), Response Error (RE), Total Responses (TR), Analytic (Ap), Relational (Rp), and Categorical-Inferential (Ip) proportions, CA and MA: Schools A and B.

	SE	RL	RE	TR	Ap	Rp	CIp	CA	MA
SE	.00	.44	-.32	.40	-.02	-.01	.08	.40	.65
RL	-.13	.00	-.45	.51	-.20	.18	.16	.39	.70
RE	-.03	-.66	.00	-.19	.09	.11	-.26	-.52	-.44
TR	.24	-.05	-.08	.00	-.07	-.02	.13	.22	.62
Ap	.07	-.01	.12	-.39	.00	-.75	-.66	.08	-.14
Rp	.06	-.12	-.20	.58	-.77	.00	.02	-.23	-.10
CIp	-.12	.08	.10	-.05	-.67	.05	.00	.23	.31
A. CA	-.27	.33	-.13	-.59	.01	-.27	.23	.00	.37
MA	.31	.00	-.22	.13	-.11	.27	-.14	-.36	.00

critical r value for p .05=.42

critical r value for p .01=.54

Note - School A to the left and below the diagonal (n=20)  
School B to the right and above the diagonal (n=20)



TABLE 3

Means and Standard Deviations for all variables by Schools

VARIABLE	School A		School B	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Spatial Egocentrism	1.87	.60	2.05	.77
Response Latency	10.77	8.67	10.79	5.36
Response Error	1.64	.57	1.73	.80
Total CST Responses	27.55	10.51	23.90	4.39
Proportion Analytic	.54	.23	.50	.18
Proportion Relational	.20	.17	.22	.13
Proportion Cat-Inf	.25	.14	.26	.13
CA	81.40	6.36	78.50	8.41
MA	79.60	12.61	87.15	17.77

The total sample of Ss were then grouped as reflective and impulsives based on the total sample median splits on response latency and error. A t-test performed on their spatial egocentrism scores was significant ( $t=2.74$ ,  $df=28$ ,  $p < .02$ ). Reflective Ss exhibited significantly better decentration abilities than impulsive Ss.

However, as the reflective and impulsive groups differed significantly ( $p < .05$ ) in mean MA's (91.2 and 75.5 respectively), and MA was significantly related to both the decentration and R-I measures, an analysis of covariance was performed to account for MA in the Decentration-R-I relationship. Analysis of covariance for the MA variable indicated no significant difference between the reflectives and impulsives in their spatial egocentrism scores when MA was taken into account.

To analyze for the relationship of conceptual style to spatial abilities, the Ss were divided into High and Low decentration groups. The Low group consisted of those Ss whose transformed scores ranged from 0.71 to 1.87, indicating successful performances on the first spatial display only. The High decentration group's transformed scores ranged from 2.12 to 3.39 indicating successful performance beyond Display 1. The means and standard deviations for the categorization statement proportions are presented in Table 4 below, for both the total sample and Schools A and B.

All t-tests for both schools, A and B, taken separately, were non-significant. Within each school, High and Low decenterers exhibited no significant differences with regard to their conceptual styles.

TABLE 4

Means and Standard Deviations of Conceptual Style proportions for High and Low Decentration Groups by Total Sample and Schools.

	School A				School B				Total Sample			
	Decentration Group		Decentration Group		Decentration Group		Decentration Group		Decentration Group		Decentration Group	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Ap	.48	.28	.59	.23	.49	.12	.54	.25	.48	.17	.57	.23
Rp	.25	.21	.17	.13	.20	.17	.22	.16	.23	.15	.19	.15
CIp	.27	.14	.24	.14	.26	.34	.22	.16	.28	.11	.23	.20

For the total sample, High and Low decenterers did not significantly differ in their proportional usage of analytic or relational concepts. However, a  $t$ -test approaching significance ( $t=1.83$ ,  $df=38$ ,  $p < .07$ ) indicated that High decenterers produced a greater proportion of categorical-inferential concepts than Low decenterers.

The means and standard deviations of the reflective and impulsive Ss' conceptual style proportions are presented in Table 5 below. No significant differences were found within each school between reflectives and impulsives in their conceptual styles.

For the total sample,  $t$ -tests indicated no significant differences between reflectives and impulsives in their proportional usage of relational and categorical-inferential concepts. However, a  $t$ -test approaching significance ( $t=1.80$ ,  $df=28$ ,  $p < .08$ ) suggested that the impulsive Ss used a greater proportion of analytic statements than the reflective Ss.

TABLE 5

Means and Standard Deviations of Conceptual Style proportions for Reflectives and Impulsives by Total Sample and Schools.

	School A				School B				Total Sample			
	Reflectives		Impulsives		Reflectives		Impulsives		Reflectives		Impulsives	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Ap	.42	.31	.65	.19	.50	.15	.56	.21	.46	.23	.60	.20
Rp	.27	.22	.11	.12	.20	.15	.20	.12	.24	.18	.16	.12
CIp	.29	.15	.24	.17	.29	.09	.22	.14	.29	.12	.23	.15

## CHAPTER IV

### DISCUSSION

The findings clearly supported the hypothesized relationship between reflection-impulsivity (R-I) and spatial egocentrism. Upon consideration of all data, a reflective orientation was significantly related to the ability to assume and reconstruct the spatial perspective of another individual, that is, to spatially decenter. This result was a function of mental age, such that inclusion of this variable in the analysis obviated the differences in decentration between the reflective and impulsive groups. It should be noted, however, that spatial egocentrism, as all of Piaget's variables, is an organismic variable, and as such encompasses mental age or intelligence considerations. For example, Hooper, Fitzgerald & Papalia, (1971) contend that Piagetian operations are "essentially congruent with the analage aspects [i.e. culture-free structure, and process factors] of cognitive functioning" [1971, p.6]. Similarly, Feffer and Gourevitch (1960) and Flavell (1963) accord with the Piagetian view (Piaget, 1928; 1963) of intelligence as the balance between assimilation and accommodation, this balance underlying non-egocentric functioning. Thus one would expect MA mediation between decentration measures and other variables related to MA - as with the R-I dimension. Therefore, to extract MA from the SE:R-I relationship would be to extract MA from another measure of MA. This R-I:Decentration result also appears to depend heavily on the relationship obtained with School B, which appeared to be of slightly higher social class level. The R-I relationship to spatial egocentrism (SE) was significant within this school population but non-significant within School A.

The lack of significant relationships between SE and response latency and response error for the total sample may be a function of the inclusion of 10 Ss who, due to the operational definition of R-I, were excluded from the original RI:SE comparison. These 10 Ss were those who made many errors in a relatively short period of response time. The inclusion of these 10 Ss in the correlational analysis probably wiped out any possible significant relations between the R-I related variables (response time and response errors) and SE.

Taken together, then, the data are tentatively in accordance with Piaget's epistemological considerations which underlie his concept of egocentrism. The development of knowledge, universally and individually, proceeds from phenomenological acceptance of all constructions of reality to a more precise, reflective turn of mind ("prise de conscience"), upon those constructions. That is, "...phenomenism gives way to a more progressive construction: the subject penetrates more deeply and more extensively into the object of his cognition. And egocentrism is replaced by reflection...[Flavell, 1963, pp. 256]". With increasing reflection, the subject increasingly rethinks, restructures, re-analyses and self-tests his initial assumptions and constructions.

The findings do not support the expected relationship between conceptual style and spatial decentration abilities. The use of analytic and relational concepts was unrelated to decentration. The only conceptual style which distinguished the High decentration group from the Low was the use of categorical-inferential concepts. The High decentration group used more of these latter concepts. Statistical analyses indicated a trend approaching significance ( $p = .08$ ) in favor of the high decentration group.

This finding is of importance since it serves to support Flavell's (1971) model for the development of abilities involved in making inferences about others. In this model, he emphasizes the role of inferential activity in the symbolic representation of others' visual experiences or perspectives and in the actual physical representation of their perspective. The evidence in the present study thus suggests, empirically, that inferential abilities, as measured by the CST, play an important role in spatial decentration skills.

The non-significant relationship between analytic conceptual style and spatial egocentrism contradicts previous research (Peters, 1967, 1970) that reported analytic style to be a reliable predictor of conservation abilities. However, the lack of a similar relationship with spatial decentration may be due to a number of factors. First, although a "decentration" factor appears to underlie both conservation and SE tasks, these tasks appear unrelated (Rubin, 1971) at the age level of this sample. This relationship increases with age, so that at ages 7-8, the correlation between SE and conservation approaches significance, and is significant by the time children reach the ages 10-11 (Rubin, 1971). Also, although these two tasks involve the required simultaneous consideration of a number of dimensions, only the spatial task involves the additional factor of role-taking, that is, the ability to infer the perceptual activities and experiences of another person.

An incidental finding of note concerns the relationship between R-I and conceptual style. Kagan and his associates (Kagan et al., 1963, 1964) have long held that a positive relationship exists between a reflective attitude and analytic conceptual style. However, examination of the present data indicated that reflective Ss were marginally ( $p < .08$ )

lower in production of analytic concepts on the CST. Moreover, upon considering the relationship between analytic style and response errors and latencies, Kagan, himself, found non-significant correlations to exist. This latter finding was mirrored by the present correlational data as well. Thus, from Kagan's original research, and theory, and from the present investigation, it appears as if the proposed R-I and analytic style relationship is empirically nonexistent. These findings are in accordance with Denney's (1972) recent study in which he found no relationship to exist between the frequency of analytic responses on the CST and response latencies on the MFF for second grade boys.

With regard to the third hypothesis concerning social class differences, it was suggested that School A children would be more spatially egocentric than School B children. This hypothesis was offered since Sullivan and Hunt (1967) and Wei et al., (1971) have both shown lower socio-economic status children to perform more poorly on decentration tasks than middle socio-economic class children. However, the present study found no differences in spatial egocentrism between the two school samples. The lack of differences between the two schools on all other variables would suggest that the schools did not differ substantially in social class. Both schools' populations appear to fall within the low-middle to middle social class range. This explanation must be tempered in the light of the correlational differences found between both schools.

The intercorrelations of all variables for the total sample provided supportive evidence for an I.Q. or M.A. relationship to spatial egocentrism thereby supporting previous studies (e.g. Rubin, 1973). Similarly the relationships of both response latency and response error on the MFF to CA is in accord with Kagan's findings (Kagan, et al., 1964). The relationship between response error and MA indicates that correct



solution on the MFF is still tied to verbal intelligence despite the attempts to obviate this relationship (Kagan, et al., 1964).

The differences in the correlations found within each school population provide some indication of cultural or social class differences or perhaps merely school differences. MA was significantly and positively related to spatial decentration within School B and not within School A. MA was significantly related to both response latency and response error in School B. These relationships did not exist within School A. Also, within School B, total responses on the CST was significantly related to both response latency and MA. Within School A, total responses was related to the proportion of relational concepts. Thus, in general, the evidence indicates that only within School B is the tendency to delay responding on the MFF related to total responses on the CST and MA. These findings are interesting in light of anecdotal evidence concerning the teachers within the two schools. Within School B, the teachers of the sample group were reflective, seemingly emphasizing interpersonal skills.

In the light of the relationship found between the use of categorical-inferential concepts and spatial egocentrism, it is interesting to note that very little research has been done on the etiology of this conceptual style. Both relational and analytical conceptual styles have been probed in depth (Kagan, et al., 1963; 1964), the former appearing culturally maladaptive and the latter indicative of cognitive growth and maturity. The categorical-inferential style has been very seldom reported, perhaps because most of the studies on conceptual style have dealt with cognitive functioning in the impersonal, physical world. The evidence in this study would suggest that when the focus moves to social cognition - interactions and relations with others - another conceptual style may become salient, and possibly incompatible with the analytic and

relational styles. Therefore, investigations of this categorical-inferential style may prove fruitful within the framework of the development inferences about others, as suggested by Flavell (1971).

The present findings also provide an interesting foundation for an investigation into familial, cultural, and school conditions which are conducive to the development of decentration skills - an area which has not been considered up to this time. The work by Hess and Shipman (1965, 1967, 1968) and Bee (1969) has suggested that social class differences in mother-child interaction styles along the elaborated-restricted language dimension, and the person-status control dimension lead to noticeable differences in the child's reflectiveness and conceptual style. Teaching styles, no doubt, also vary along such dimensions, although little, if any research has been done in this area. Thus, these dynamics could be expanded in a study to include decentration skills and formal measures of reflectiveness, and provide at the same time, replication of the present study.

Also, it is suggested that further work might investigate other measures of decentration skills (communication, conservation, role-taking) in relation to the reflection-impulsivity dimension.

## APPENDIX A

## RAW DATA

S#	Grade		C.A.	M.A.	Decentration		MFF		CST			
	K=1	G1=2			SE	SEtf	RL	RE	TR	AF	RF	Clf
1	2	70		105	4	2.12	9.0	1.5	58	15	32	11
2	2	87		76	3	1.87	7.33	1.91	25	13	9	3
3	2	80		98	8	2.92	9.00	1.50	23	19	1	3
4	2	81		71	2	1.58	6.30	1.50	30	19	4	7
5	2	87		87	8	2.92	7.80	1.25	25	11	9	5
6	2	77		59	3	1.87	6.25	2.0	50	29	9	12
7	2	84		80	3	1.87	38.5	0.3	24	18	2	4
8	2	79		100	0	0.71	5.4	1.42	20	9	7	4
9	2	92		63	2	1.58	7.5	2.58	20	11	3	6
10	2	101		74	0	0.71	28.4	0.92	19	6	2	9
11	2	78		84	2	1.58	5.5	2.20	20	15	0	5
12	2	77		94	6	2.55	9.26	1.33	27	16	4	7
13	2	78		82	5	2.34	21.1	1.50	33	22	5	6
14	2	77		82	4	2.12	11.32	1.67	37	3	21	12
15	2	81		71	5	2.34	6.23	1.58	26	15	3	8
16	2	83		64	2	1.58	5.82	1.25	20	12	4	3
17	2	84		80	3	1.87	5.55	2.0	20	16	0	4
18	2	76		70	1	1.22	8.38	2.33	22	21	0	1
19	2	81		82	4	2.12	6.42	2.75	19	7	1	11
20	2	77		70	2	1.58	11.1	1.33	33	3	13	17

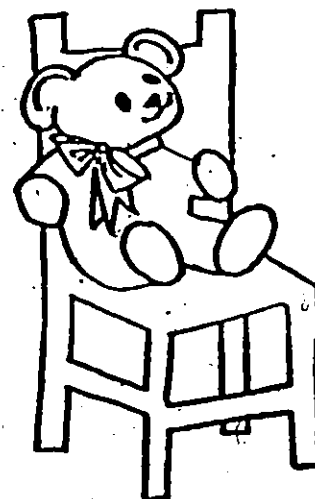
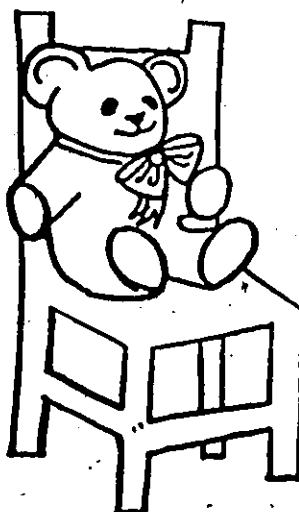
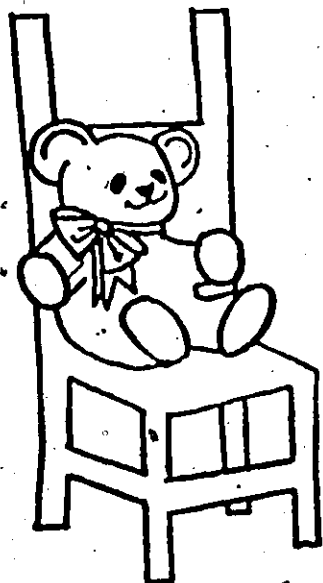
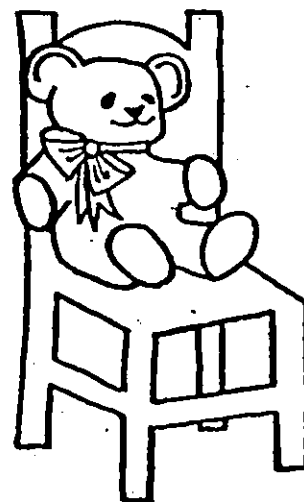
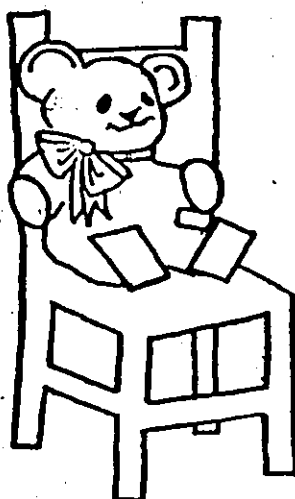
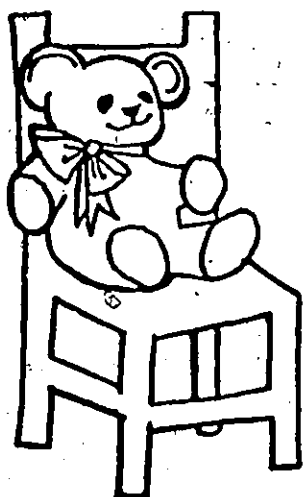
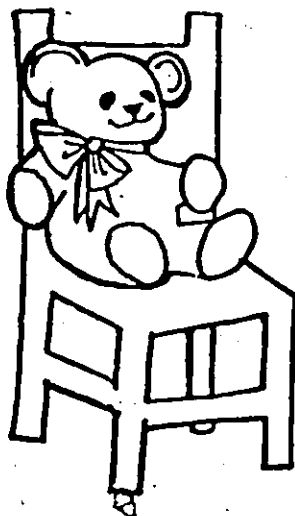
## RAW DATA (continued)

S#	Grade K=1 G1=2	C.A.	M.A.	Decentration		MFF		CST			
				SE	SEtf	RL	RE	TR	AF	RF	CI f
21	2	86	68	4	2.12	4.6	2.5	21	10	5	6
22	2	82	70	1	1.22	10.9	2.5	25	15	6	4
23	2	88	66	4	2.12	8.2	1.25	20	15	1	4
24	2	82	122	6	2.55	20.5	2.1	37	20	6	11
25	2	79	78	0	0.71	6.75	1.75	24	12	3	9
26	2	80	94	6	2.55	10.9	1.33	22	10	3	9
27	2	86	112	11	3.39	12.0	.80	24	16	3	5
28	2	81	98	4	2.12	8.8	.85	23	11	5	7
29	1	68	61	1	1.22	8.1	1.91	19	12	6	1
30	1	69	98	5	2.34	5.8	2.75	24	11	7	4
31	1	71	82	3	1.87	8.1	1.70	24	18	2	2
32	2	87	121	6	2.55	21.5	.33	28	12	3	13
33	1	72	82	3	1.87	14.5	.75	29	7	15	6
34	2	86	94	11	3.39	11.2	.75	29	15	4	10
35	2	98	98	5	2.34	18.0	1.25	23	10	8	5
36	1	72	96	7	2.74	19.8	2.10	20	7	8	5
37	1	69	74	2	1.58	7.45	2.90	22	21	0	1
38	1	71	80	6	2.55	5.37	3.16	26	8	9	9
39	1	74	78	0	0.71	4.4	1.83	19	8	3	7
40	1	69	71	1	1.22	9.0	2.16	19	4	6	9

Note - School A, Ss #1-20  
 School B, Ss #21-40

## APPENDIX B

## EXAMPLE FROM MATCHED FAMILIAR FIGURES TEST



APPENDIX C  
EXAMPLE FROM CONCEPTUAL STYLE TEST

13



O



P



R

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